UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/609,822	07/03/2000	Jin-gyo Seo	1293.1076D/STB	2532

21171 7590 02/25/2005

STAAS & HALSEY LLP
SUITE 700
1201 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER	
BATTAGLIA, MICHAEL V	
ART UNIT	**PAPER NUMBER**
2652	

DATE MAILED: 02/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/609,822	SEO ET AL.
	Examiner	Art Unit
	Michael V Battaglia	2652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-26 and 28-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19,20,25,26,28,31-37 and 43-47* is/are rejected.

7)☒ Claim(s) *21-24,29,30 and 38-42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Application serial number 09/609,822 is a divisional of United States application 09/359,128 filed on July 23, 1999. Applicant's claim for priority under 35 U.S.C. 119(a)-(d) is partially based upon an applications filed in Korea on February 11, 1998 and December 30, 1997. A claim for priority under 35 U.S.C. 119(a)-(d) cannot be based on said applications, since the United States application was filed more than twelve months thereafter. The priority date for application 09/609,822 is therefore July 23, 1998 based on the filing date of Korean application 98-29732. It is noted that the July 23, 1998 priority date has been perfected by the translation filed on September 22, 2004.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 19, 35 and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Hara (US 6,044,055).

In regard to claim 19, Hara discloses a recording and/or reproducing apparatus (Figs. 5 and 7) recording and/or reproducing data on a recording medium, comprising: a discriminator (Fig. 7, element 14) to discriminate a magnitude of a present mark of input data and magnitudes of leading

and/or trailing spaces of the present mark (Col. 11, line 66-Col. 12, line 32 and Col. 10, lines 62-67); a generator (Fig. 7, elements 12 and 15-21) to control generation of a write pulse waveform in accordance with one or more grouping tables (Fig. 7, element 15) having width data of first and/or last pulses for the write pulse waveform according to the magnitude of the present mark of the input data and the magnitudes of the leading and/or trailing spaces (Col. 10, lines 62-67; Col. 12, lines 26-31; and Col.16, lines 40-44); and a driver (Fig. 5, element 3) to drive a light source by converting the write pulse waveform into a current signal in accordance with driving power levels for the write pulse waveform (Col. 7, lines 25-34). The discriminator of Hara discriminates a magnitude of a present mark of input data and magnitudes of leading and/or trailing spaces of the present mark by supplying the grouping table of Hara with the information necessary to output pulse widths (delays) of first and last pulses suitable for the lengths of marks and spaces to be formed in the data (Col. 10, lines 62-67 and Col. 12, lines 29-32). The RAM of Fig. 7, element 15 of Hara is a grouping table because all sequences having the same AA[11:8] and AA[3:0] a grouped together as a particular "arrangement of modulated data" (Fig. 7; Col. 12, lines 10-17; and Col. 16, lines 40-44). The width data of first and/or last pulses is according to the magnitude of the present mark of the input data and the magnitudes of the leading and/or trailing spaces because the width data are used to vary the widths of first and last pulses in accordance with the length of marks and spaces to be recorded and particular attention is paid to compensating for short marks and spaces (Col. 10, lines 62-67 and Col. 16, lines 40-56).

In regard to claim 35, Hara discloses a recording and/or reproducing apparatus (Figs. 5 and 7) recording and/or reproducing data on a recording medium, comprising: a generator (Fig. 7, elements 12 and 15-21) to generate an adaptive write pulse using one or more grouping tables (Fig. 7, element 15) having width data of first and/or last pulses of a write pulse waveform according to a

magnitude of a present mark of the-input data and magnitudes of leading and/or trailing spaces of the present mark (Col. 10, lines 62-67; Col. 12, lines 26-31; and Col.16, lines 40-44); and a processor (Fig. 5, element 5) to process data on a recording medium. The RAM of Fig. 7, element 15 of Hara is a grouping table because all sequences having the same AA[11:8] and AA[3:0] a grouped together as a particular "arrangement of modulated data" (Fig. 7; Col. 12, lines 10-17; and Col. 16, lines 40-44). The width data of first and/or last pulses is according to the magnitude of the present mark of the input data and the magnitudes of the leading and/or trailing spaces because the width data are used to vary the widths of first and last pulses in accordance with the length of marks and spaces to be recorded and particular attention is paid to compensating for short marks and spaces (Col. 10, lines 62-67 and Col. 16, lines 40-56).

In regard to claim 36, Hara discloses that the adaptive write pulse includes a first pulse, a last pulse and a multi-pulse train (Fig. 12J), and is different in respective zones on the recording medium (Col. 10, lines 39-47 and Col. 16, lines 40-44).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 20, 25, 26, 28, 31-34 and 43-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hara in view of Furukawa et al (hereafter Furukawa) (US 6,345,026).

In regard to claim 20, Hara discloses the recording and reproducing apparatus of claim 19, wherein the generator includes: a write waveform controller (Fig. 7, elements 12, 15 and 17-20) to generate pulse width data to vary a width of the first pulse of the write pulse and to vary a width of the last pulse of the write pulse; and a write pulse generator (Fig. 7, elements 16 and 21) to generate the write pulse waveform in accordance with the pulse width data. Hara is not specific on how the delay amounts (width data) of the grouping table of Hara are selected according to the arrangement of modulated data other than that recording is compensated in accordance with the lengths of marks and spaces (Col. 10, lines 62-64). As a result, Hara does not disclose that the width of the first pulse is varied in accordance with the magnitude of the leading space and the magnitude of the present mark or that the last pulse is varied in accordance with the magnitude of the present mark and the magnitude of the trailing space. It is noted that the delay amounts stored in the grouping table of Hara change the position of the front-edge of the first pulse and the end-edge of the last pulse to correct edge deviations in recorded marks due to thermal interference (Fig. 12 and Col. 16, lines 40-44).

Furukawa discloses selecting delay amounts of the front-edge of the first pulse of a write pulse waveform in accordance with the magnitude of the leading space and the magnitude of the present mark (Col. 2, lines 39-53 and Col. 6, Table 1) and selecting delay amounts of the end-edge of the last pulse of the write pulse waveform in accordance with the magnitude of the present mark and the magnitude of the trailing space (Col. 3, lines 14-22 and Col. 7, Table 2) to correct edge deviations in recorded marks due to thermal interference (Col. 3, lines 8-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select delay amounts of the front-edge of the first pulse of Hara from the grouping table of Hara in accordance with the magnitude of the leading space and the magnitude

of the present mark and to select delay amounts of the end-edge of the last pulse of Hara from the grouping table of Hara in accordance with the magnitude of the present mark and the magnitude of the trailing space as suggested by Furukawa, the motivation being to select delay amounts in a manner known in the art to correct edge deviations in recorded marks due to thermal interference. It is noted that by selecting delay amounts from the grouping table of Hara in the manner suggested by Furukawa, the width of the first pulse of Hara is varied in accordance with the magnitude of the leading space and the magnitude of the present mark of Hara and the last pulse of Hara is varied in accordance with the magnitude of the present mark and the magnitude of the trailing space of Hara.

In regard to claim 25, Hara discloses that light power for a predetermined one of channels of the adaptive write pulse that is applied during a period corresponding to a varied width of the first pulse and during a period corresponding to a varied width of the last pulse (Figs. 2 and 12J and Col. 7, lines 30-34).

In regard to claim 26, Hara discloses light power for the predetermined channel that is a read power or a write power (Fig. 2 and Col. 7, lines 30-34).

In regard to claim 28, Hara discloses the recording and/or reproducing apparatus of claim 19 wherein the generator generates pulse width data by varying a rising edge of the first pulse of the write pulse. However, Hara is not specific on how the generator selects delay amounts (width data) from the grouping table of Hara according to the arrangement of modulated data other than that recording is compensated in accordance with the lengths of marks and spaces (Col. 10, lines 62-64). As a result, Hara does not disclose that the rising edge of the first pulse is varied in accordance with the magnitude of the leading space and the magnitude of the present mark. It is noted that the delay amounts stored in the grouping table of Hara vary the position of the rising

edge of the first pulse to correct edge deviations in recorded marks due to thermal interference (Fig. 12 and Col. 16, lines 40-44).

Furukawa discloses selecting a delay amount to vary the rising edge of the first pulse of a write pulse waveform in accordance with the magnitude of the leading space and the magnitude of the present mark (Col. 2, lines 39-53 and Col. 6, Table 1) to correct edge deviations in recorded marks due to thermal interference (Col. 3, lines 8-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a delay amount to vary the rising edge of the first pulse of Hara from the grouping table of Hara in accordance with the magnitude of the leading space and the magnitude of the present mark as suggested by Furukawa, the motivation being to select a delay amount in a manner known in the art to correct edge deviations in recorded marks due to thermal interference. It is noted that by selecting delay amounts from the grouping table of Hara in the manner suggested by Furukawa, the rising edge of the first pulse of Hara is varied in accordance with the magnitude of the leading space and the magnitude of the present mark of Hara.

In regard to claim 31, Hara discloses the recording and/or reproducing apparatus of claim 19 wherein the generator generates pulse width data by varying a falling edge of the last pulse of the write pulse. However, Hara is not specific on how the generator selects delay amounts (width data) from the grouping table of Hara according to the arrangement of modulated data other than that recording is compensated in accordance with the lengths of marks and spaces (Col. 10, lines 62-64). As a result, Hara does not disclose that the last pulse is varied in accordance with the magnitude of the present mark and the magnitude of the trailing space. It is noted that the delay amounts stored in the grouping table of Hara vary the position of the falling edge of the last pulse

to correct edge deviations in recorded marks due to thermal interference (Fig. 12 and Col. 16, lines 40-44).

Furukawa discloses selecting delay amounts of the falling edge of the last pulse of the write pulse waveform in accordance with the magnitude of the present mark and the magnitude of the trailing space (Col. 3, lines 14-22 and Col. 7, Table 2) to correct edge deviations in recorded marks due to thermal interference (Col. 3, lines 8-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select delay amounts of the falling edge of the last pulse of Hara from the grouping table of Hara in accordance with the magnitude of the present mark and the magnitude of the trailing space as suggested by Furukawa, the motivation being to select a delay amount in a manner known in the art to correct edge deviations in recorded marks due to thermal interference. It is noted that by selecting delay amounts from the grouping table of Hara in the manner suggested by Furukawa, the falling edge of the last pulse of Hara is varied in accordance with the magnitude of the present mark and the magnitude of the trailing space of Hara.

In regard to claim 32, Hara discloses a recording and/or reproducing apparatus recording and/or reproducing data on a recording medium, comprising: a generator (Fig. 7, elements 12 and 15-21) to generate an adaptive write pulse, by varying a rising edge of a first pulse of the write pulse and varying a falling edge of a second pulse of the write pulse (Figs. 12I and 12J), based on at least one table (Fig. 7, element 15) storing width data of the first and/or second pulses (Col. 12, lines 26-31 and Col.16, lines 40-44); and a driver (Fig. 5, element 3) to drive the light source according to the adaptive write pulse (Col. 7, lines 25-34). Hara is not specific on how the rising edge of the first pulse and the falling edge of the second pulse are varied according to the arrangement of modulated data other than that recording is compensated in accordance with the lengths of marks

and spaces (Col. 10, lines 62-64). As a result, Hara does not disclose that the rising edge of the first pulse in varied in accordance with a magnitude of a leading space and a magnitude of a present mark or that the falling edge of the second pulse is varied in accordance with the magnitude of a trailing space and the magnitude of the present mark. Hara also does not disclose that the width data of first and second pulses is stored in a leading and/or trailing space grouping format. It is noted that the delay amounts stored in the grouping table of Hara vary the rising edge of the first pulse and the falling edge of the second pulse to correct edge deviations in recorded marks due to thermal interference (Fig. 12 and Col. 16, lines 40-44).

Furukawa discloses varying the rising edge of the first pulse in accordance with a magnitude of a leading space and a magnitude of a present mark (Col. 2, lines 39-53 and Col. 6, Table 1) and varying the falling edge of the second pulse in accordance with the magnitude of a trailing space and the magnitude of the present mark (Col. 3, lines 14-22 and Col. 7, Table 2) to correct edge deviations in recorded marks due to thermal interference (Col. 3, lines 8-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the rising edge of the first pulse of Hara in accordance with a magnitude of a leading space and a magnitude of a present mark and to vary the falling edge of the second pulse of Hara in accordance with the magnitude of a trailing space and the magnitude of the present mark as suggested by Furukawa, the motivation being to vary the rising edge of the first pulse and the falling edge of a second pulse in a manner known in the art to correct edge deviations in recorded marks due to thermal interference. It is noted that by varying the edges of the pulses of Hara in the manner suggested by Furukawa, width data of a first pulse is generated according to the magnitude of a leading space and the width data of the second pulse is generated according to the magnitude of a trailing space. Therefore, width data of first and second pulses are

stored in a leading or trailing space grouping format because the width data is either for the first pulse and part of the leading space group or for the second pulse and part of the trailing space group.

In regard to claim 33, Hara discloses an adaptive write pulse generating circuit (Figs. 5 and 7), the adaptive write pulse being used for writing input data to an optical recording medium, comprising: a write pulse inputting unit (Fig. 7, element 16) inputting a write pulse, the write pulse including a first pulse, a last pulse and a multi-pulse train; a generator (Fig. 7, elements 12, 15 and 17-21) generating the adaptive write pulse, by varying a rising edge of the first and varying a falling edge of the second pulse (Figs. 12I and 12J), based on at least one table (Fig. 7, element 15) storing width data of the first and/or second pulses (Col. 12, lines 26-31 and Col.16, lines 40-44); and an outputting unit (Fig. 5, element 3) to output the generated adaptive write pulse (Col. 7, lines 25-34). Hara is not specific on how the rising edge of the first pulse and the falling edge of the second pulse are varied according to the arrangement of modulated data other than that recording is compensated in accordance with the lengths of marks and spaces (Col. 10, lines 62-64). As a result, Hara does not disclose that the rising edge of the first pulse in varied in accordance with a magnitude of a leading space and a magnitude of a present mark or that the falling edge of the second pulse is varied in accordance with the magnitude of a trailing space and the magnitude of the present mark. Hara also does not disclose that the width data of first and second pulses is stored in a leading and/or trailing space grouping format. It is noted that the delay amounts stored in the grouping table of Hara vary the rising edge of the first pulse and the falling edge of the second pulse to correct edge deviations in recorded marks due to thermal interference (Fig. 12 and Col. 16, lines 40-44).

Furukawa discloses varying the rising edge of the first pulse in accordance with a magnitude of a leading space and a magnitude of a present mark (Col. 2, lines 39-53 and Col. 6, Table 1) and varying the falling edge of the second pulse in accordance with the magnitude of a trailing space and the magnitude of the present mark (Col. 3, lines 14-22 and Col. 7, Table 2) to correct edge deviations in recorded marks due to thermal interference (Col. 3, lines 8-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the rising edge of the first pulse of Hara in accordance with a magnitude of a leading space and a magnitude of a present mark and to vary the falling edge of the second pulse of Hara in accordance with the magnitude of a trailing space and the magnitude of the present mark as suggested by Furukawa, the motivation being to vary the rising edge of the first pulse and the falling edge of a second pulse in a manner known in the art to correct edge deviations in recorded marks due to thermal interference. It is noted that by varying the edges of the pulses of Hara in the manner suggested by Furukawa, width data of a first pulse is generated according to the magnitude of a leading space and the width data of the second pulse is generated according to the magnitude of a trailing space. Therefore, width data of first and second pulses are stored in a leading or trailing space grouping format because the width data is either for the first pulse and part of the leading space group or for the second pulse and part of the trailing space group.

In regard to claim 34, Hara discloses a recording and/or reproducing apparatus (Figs. 5 and 7) recording and/or reproducing data on a recording medium, comprising: a generator (Fig. 7, elements 12 and 15-21) to generate an adaptive write pulse using a grouping table (Fig. 7, element 15) having width data for a pulse of a write pulse waveform (Col. 12, lines 26-31 and Col.16, lines 40-44); and a processor (Fig. 5, element 5) to process data on a recording medium, wherein the

width data comprises rising edge information of the pulse (Figs. 12I and 12J). The RAM of Fig. 7, element 15 of Hara is a grouping table because all sequences having the same AA[11:8] and AA[3:0] a grouped together as a particular "arrangement of modulated data" (Fig. 7; Col. 12, lines 10-17; and Col. 16, lines 40-44). Hara is not specific on how the width data of the grouping table is selected according to the arrangement of modulated data other than that recording is compensated in accordance with the lengths of marks and spaces (Col. 10, lines 62-64). As a result, Hara does not disclose that the width data is in accordance with a magnitude of a present mark of input data and a magnitude of a leading space of the present mark. It is noted that the delay amounts (width data) stored in the grouping table of Hara vary the rising edge of the pulse to correct edge deviations in recorded marks due to thermal interference (Fig. 12 and Col. 16, lines 40-44).

Furukawa discloses selecting delay amounts of the rising edge of a pulse of a write pulse waveform in accordance with a magnitude of a present mark of input data and a magnitude of a leading space of the present mark (Col. 2, lines 39-53 and Col. 6, Table 1) to correct edge deviations in recorded marks due to thermal interference (Col. 3, lines 8-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select delay amounts of the rising edge of the pulse of Hara from the grouping table of Hara in accordance with the magnitude of a present mark of input data and the magnitude of a leading space of the present mark as suggested by Furukawa, the motivation being to select a delay amount of the rising edge of the pulse in a manner known in the art to correct edge deviations in recorded marks due to thermal interference. It is noted that by selecting delay amounts from the grouping table of Hara in the manner suggested by Furukawa, the width data is in accordance with a magnitude of the present mark of input data of Hara and the magnitude of a leading space of the present mark.

In regard to claim 43, Hara discloses a recording and/or reproducing apparatus (Figs. 5 and 7) recording and/or reproducing data on a recording medium, comprising: a generator (Fig. 7, elements 12 and 15-21) to generate an adaptive write pulse comprising a pulse with a variable pulse width (Figs. 12I and 12J); and a processor (Fig. 5, element 5) to process data on a recording medium. Hara is not specific on how the pulse width is varied according to the arrangement of modulated data other than that recording is compensated in accordance with the lengths of marks and spaces (Col. 10, lines 62-64). As a result, Hara does not discloses that the pulse width is varied according to a magnitude of a present mark of input data and a magnitude of a leading space of the present mark. It is noted that the delay amounts (width data) of Hara vary the rising edge of the pulse to correct edge deviations in recorded marks due to thermal interference (Fig. 12 and Col. 16, lines 40-44).

Furukawa discloses selecting delay amounts of the rising edge of a pulse of a write pulse waveform in accordance with a magnitude of a present mark of input data and a magnitude of a leading space of the present mark (Col. 2, lines 39-53 and Col. 6, Table 1) to correct edge deviations in recorded marks due to thermal interference (Col. 3, lines 8-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select delay amounts of the rising edge of the pulse of Hara in accordance with the magnitude of a present mark of input data and the magnitude of a leading space of the present mark as suggested by Furukawa, the motivation being to select a delay amount of the rising edge of the pulse in a manner known in the art to correct edge deviations in recorded marks due to thermal interference. It is noted that by selecting delay amounts (width data) of Hara in the manner suggested by Furukawa, the pulse width of the pulse of Hara is varied according to a

magnitude of the present mark of input data of Hara and the magnitude of a leading space of the present mark.

In regard to claim 44, Hara discloses that the pulse width is varied by varying an edge placement of the pulse, including varying a rising edge placement of the pulse (Figs. 12I and 12J). In the recording and/or reproducing apparatus of Hara in view of Furukawa, varying a rising edge placement of the pulse is based on the magnitude of the present mark and the magnitude of the leading space of the present mark (see rejection of claim 43 above).

In regard to claim 45, Hara discloses the recording and/or reproducing apparatus of claim 44, wherein the pulse width of another pulse of the adaptive write pulse is varied by varying an edge placement of the other pulse, including varying a falling edge of the other pulse (Figs. 12I and 12J). Hara is not specific on how the falling edge of the other pulse is varied according to the arrangement of modulated data other than that recording is compensated in accordance with the lengths of marks and spaces (Col. 10, lines 62-64). As a result, Hara does not discloses that the falling edge of the other pulse is varied according to the magnitude of the present mark and a magnitude of a trailing space of the present mark. It is noted that the delay amounts (width data) of Hara vary the falling edge of the other pulse to correct edge deviations in recorded marks due to thermal interference (Fig. 12 and Col. 16, lines 40-44).

Furukawa discloses selecting delay amounts of the falling edge of a pulse of a write pulse waveform in accordance with a magnitude of the present mark and a magnitude of a trailing space of the present mark (Col. 3, lines 14-22 and Col. 7, Table 2) to correct edge deviations in recorded marks due to thermal interference (Col. 3, lines 8-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select delay amounts of the falling edge of the other pulse of Hara in

accordance with the magnitude of the present mark and the magnitude of a trailing space of the present mark as suggested by Furukawa, the motivation being to select a delay amount of the falling edge of the other pulse in a manner known in the art to correct edge deviations in recorded marks due to thermal interference. It is noted that by selecting delay amounts (width data) of Hara in the manner suggested by Furukawa, the falling edge of the other pulse of Hara is varied according to the magnitude of the present mark of Hara and a magnitude of a trailing space of the present mark.

In regard to claim 46, Hara discloses that the pulse width is varied by varying an edge placement of the pulse, including varying **rising** and/**or** falling edges of the pulse (Figs. 12I and 12J). In the recording and/or reproducing apparatus of Hara in view of Furukawa, varying **rising** and/**or** falling edges of the pulse is according to the magnitude of the present mark and the **magnitude of the leading space** and/**or** a magnitude of a trailing space of the present mark (see rejection of claim 43 above).

In regard to claim 47, Hara discloses a recording and/or reproducing apparatus (Figs. 5 and 7) recording and/or reproducing data on a recording medium, comprising: a generator (Fig. 7, elements 12 and 15-21) to generate an adaptive write pulse comprising a pulse with a variable pulse width (Figs. 12I and 12J); and a processor (Fig. 5, element 5) to process data on a recording medium. Hara is not specific on how the pulse width is varied according to the arrangement of modulated data other than that recording is compensated in accordance with the lengths of marks and spaces (Col. 10, lines 62-64). As a result, Hara does not discloses that the pulse width is varied according to a magnitude of a present mark of input data and a magnitude of a trailing space of the present mark. It is noted that the delay amounts (width data) of Hara vary the falling edge of the

pulse to correct edge deviations in recorded marks due to thermal interference (Fig. 12 and Col. 16, lines 40-44).

Furukawa discloses selecting delay amounts of the falling edge of a pulse of a write pulse waveform in accordance with a magnitude of a present mark of input data and a magnitude of a trailing space of the present mark (Col. 3, lines 14-22 and Col. 7, Table 2) to correct edge deviations in recorded marks due to thermal interference (Col. 3, lines 8-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select delay amounts of the falling edge of the pulse of Hara in accordance with the magnitude of a present mark of input data and the magnitude of a trailing space of the present mark as suggested by Furukawa, the motivation being to select a delay amount of the falling edge of the pulse in a manner known in the art to correct edge deviations in recorded marks due to thermal interference. It is noted that by selecting delay amounts (width data) of Hara in the manner suggested by Furukawa, the pulse width of the pulse of Hara is varied according to a magnitude of the present mark of input data of Hara and the magnitude of a trailing space of the present mark.

4. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hara as applied to claim 35 above, and further in view of Nishiuchi et al (hereafter Nishiuchi) (US 5,568,461).

Hara discloses the recording and/or reproducing apparatus of claim 35 but does not disclose that the write pulse waveform is based on whether input data is in a land track or a groove track.

Nishiuchi discloses a recording and/or reproducing apparatus that optimizes write pulse waveforms for either a land track and a groove track (Col. 14, lines 7-13) and teaches that using recording signals optimized for writing on a land or a groove will reduce error that is generated

when the same recording signal is used for both lands and a grooves (Col. 2, lines 35-39 and Col. 6, lines 36-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for write pulse waveform of the recording and/or reproducing apparatus of Hara to be optimized based on whether the input data is in a land track or a groove track as suggested by Nishiuchi, the motivation being to reduce error caused by writing to both land and groove tracks in the same manner.

Allowable Subject Matter

5. Claims 21-24, 29, 30 and 38-42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regard to claim 21, none of the references of record alone or in combination suggest or fairly teach a recording and/or reproducing apparatus recording and/or reproducing data on a recording medium, comprising: a discriminator to discriminate a magnitude of a present mark of input data and magnitudes of leading and/or trailing spaces of the present mark; a generator to control generation of a write pulse waveform in accordance with one or more grouping tables having width data of first and/or last pulses for the write pulse waveform according to the magnitude of the present mark of the input data and the magnitudes of the leading and/or trailing spaces; and a driver to drive a light source by converting the write pulse waveform into a current signal in accordance with driving power levels for the write pulse waveform, wherein the generator includes: a write waveform controller to generate pulse width data to vary a width of the first pulse of the write pulse in accordance with the magnitude of the leading space and the magnitude of the

present mark and to vary a width of the last pulse of the write pulse in accordance with the magnitude of the present mark and the magnitude of the trailing space; and a write pulse generator to generate the write pulse waveform in accordance with the pulse width data, to claim 20, wherein the write waveform controller comprises a memory in which **the pulse width data** of the first and/or last pulses for the write pulse waveform **are stored, by grouping the magnitude of the present mark and the magnitudes of the leading and/or trailing spaces, into a short pulse group, a middle pulse group or a long pulse group.**

In regard to claim 29, none of the references of record alone or in combination suggest or fairly teach a recording and/or reproducing apparatus recording and/or reproducing data on a recording medium, comprising: a discriminator to discriminate a magnitude of a present mark of input data and magnitudes of leading and/or trailing spaces of the present mark; a generator to control generation of a write pulse waveform in accordance with one or more grouping tables having width data of first and/or last pulses for the write pulse waveform according to the magnitude of the present mark of the input data and the magnitudes of the leading and/or trailing spaces; and a driver to drive a light source by converting the write pulse waveform into a current signal in accordance with driving power levels for the write pulse waveform, wherein the generator generates pulse width data **by varying a falling edge of the first pulse of the write pulse in accordance with the magnitude of the leading space and the magnitude of the present mark.**

In regard to claim 30, none of the references of record alone or in combination suggest or fairly teach a recording and/or reproducing apparatus recording and/or reproducing data on a recording medium, comprising: a discriminator to discriminate a magnitude of a present mark of input data and magnitudes of leading and/or trailing spaces of the present mark; a generator to control generation of a write pulse waveform in accordance with one or more grouping tables

having width data of first and/or last pulses for the write pulse waveform according to the magnitude of the present mark of the input data and the magnitudes of the leading and/or trailing spaces; and a driver to drive a light source by converting the write pulse waveform into a current signal in accordance with driving power levels for the write pulse waveform, wherein the generator generates pulse width data **by varying a rising edge of the last pulse of the write pulse in accordance with the magnitude of the trailing space and the magnitude of the present mark.**

In regard to claims 38 and 42, none of the references of record alone or in combination suggest or fairly teach a recording and/or reproducing apparatus of claims 19 or 35, respectively, **wherein, in at least one of the one or more grouping tables, magnitudes corresponding to the present mark and magnitudes of leading and/or trailing spaces are grouped according to a short pulse group, a middle pulse group and a long pulse group.**

In regard to claims 39 and 40, none of the references of record alone or in combination suggest or fairly teach a recording and/or reproducing apparatus of claim 32 or adaptive write pulse generating circuit of claim 33, respectively, **wherein, in the grouping format, magnitudes corresponding to the present mark and magnitudes of leading and/or trailing spaces are grouped according to a short pulse group, a middle pulse group and a long pulse group.**

In regard to claim 41, none of the references of record alone or in combination suggest or fairly teach a recording and/or reproducing apparatus recording and/or reproducing data on a recording medium, comprising: a generator to generate an adaptive write pulse using a grouping table having width data for a pulse of a write pulse waveform according to a magnitude of a present mark of input data and a magnitude of a leading space of the present mark; and a processor to process data on a recording medium, wherein the width data comprises rising edge information of the pulse, **wherein, in the grouping table, magnitudes corresponding to the present mark and**

magnitudes of leading and/or trailing spaces are grouped according to a short pulse group, a middle pulse group and a long pulse group.

Response to Arguments

6. Applicant's arguments with respect to claims 19-26 and 28-47 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V Battaglia whose telephone number is (703) 305-4534. The examiner can normally be reached on 5-4/9 Plan with 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael Battaglia

Michael Battaglia

HOA T. NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600
2/22/05